**Classifying Bomber Characteristics Using Crime Scene Indicators: Application of an Organizational Taxonomy**

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

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ABSTRACT

CLASSIFYING BOMBER CHARACTERISTICS USING CRIME SCENE INDICATORS: APPLICATION OF AN ORGANIZATIONAL TAXONOMY

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This study explored the relationship between bombing crime scene evidence and personal characteristics of bombing offenders to determine if the offender organizational taxonomy is a valid assessment measure in criminal investigative analysis (criminal profiling). Data from a previous exploratory study of bombing offenders was used to classify 39 bombers as either organized or disorganized in their lifestyle, habits and personality traits. Eight variables representing information available in the evidence at the scene of a criminal bombing were compared with offender organization. The results showed no correlation between offender organization and bombing methodologies as well as remarkable consistency in behavior for the majority of bombing offender participants. This study did not demonstrate utility of the organizational taxonomy in the criminal investigative analysis of criminal bombers.

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# CHAPTER I

## Introduction

Criminal profiling, the process of describing the personality and behavioral characteristics of an offender based upon the analysis of his[1] crimes (Douglas and Burgess, 1986), has been popularized by the media, in films such as *Silence of the Lambs*, and various "true crime" books. Its efficacy, processes, concepts, typologies, and acceptance are the topics of debate within the discipline, academia, health care practitioners, the legal, and law enforcement communities (Rossmo, 2000).

The origins of criminal profiling are somewhat obscure, however. Holmes and Holmes (1996) as well as Pinizzotto and Finkel (1990), and Geberth (1996) acknowledge the activities of psychiatrist William Langer who described the personality of Adolph Hitler during World War II on behalf of the Office of Strategic Services, the precursor to the Central Intelligence Agency. Langer developed a personality profile, based in Freudian psychodynamic theory, which suggested Hitler was influenced by his mother's doting and his father's cold, distant, often vicious relationship with the family. Hitler was unable to form or sustain intimate relationships for any length of time because of his underlying paranoia and grandiosity. Hitler developed a messianic personality seeing himself as the savior of Germany. The war provided the stage for him to create the "Greater German Reich," using Europe's Jews as the focus for fear and hatred. Langer's

[1] Although criminal offenders are represented in both genders, the vast majority of violent criminals are

profile suggested Hitler had a sexual interest in his mother as well as sexual dysfunction and paraphilic behavior. This was later borne out by anecdotal accounts of his interest in coprophilia and urophilia. Langer offered a number of scenarios for the end of the war including, prophetically, Hitler's suicide in the face of defeat.

Between November 1940 and January 1957, George Metesky, a 53 year-old former employee of a Consolidated Edison (Con Ed) electric utility subsidiary, placed over 30 improvised destructive devices in various public places within the City of New York (Brussel, 1968). While there were no fatalities associated with these bombings, a number of injuries, some serious, were inflicted. As the sixteen-year bombing campaign wore on, the devices increased in sophistication and lethality. The diverse targets prompted the New York newspapers to write about "the Mad Bomber" which contributed to public concern bordering on mass hysteria. Metesky sent numerous letters to the police and newspapers as well as leaving communications with his bombs. Each communication was enigmatically signed "F.P." (Brussel, 1968). The letters were highly thematic, focusing on the "dastardly deeds" and "ghoulish acts" of the Con Edison utility. Ultimately discovered after Metesky's arrest was his belief that Con Ed had unjustly denied him a disability pension because of a claimed on-the-job injury. The New York police sought the assistance of Dr. James Brussel, a psychiatrist, who was New York's Assistant Commissioner of Mental Hygiene. Brussel, examining the letters, bomb-building techniques, targets, and other case facts, provided a profile of the offender that

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male as seen in the data used herein. Therefore, "he" is used throughout this thesis in reference to them.

ultimately matched Metesky. At the time of his arrest, Metesky cooperated with the police and basked in the media attention. He proudly admitted he made the bombs and sent the "F.P." letters, which he said, stood for "fair play" (Brussel, 1968).

Ault and Reese (1980) described the use of "psychological profiling" as an adjunct to the normal instructional programs of the Behavioral Science Unit (BSU) at the Federal Bureau of Investigation (FBI) Academy in Quantico, Virginia. BSU personnel reviewed investigative materials from unsolved cases submitted by various law enforcement agencies and prepared analyses in order to "identify and interpret certain items of evidence at the crime scene which would be indicative of the personality type of the individual or individuals committing the crime" (p. 23).

In 1981, retired Los Angeles homicide unit commander Pierce Brooks, working with the BSU, developed a system to collect, organize, analyze, and disseminate information about violent crimes. Called the Violent Criminal Apprehension Program (VICAP), the program was designed to identify specific information, primarily of murders and sexual assaults, in order to link crimes across jurisdictional boundaries. VICAP was combined with the psychological profiling efforts of the BSU and, in 1984, President Ronald Reagan announced the creation of the National Center for the Analysis of Violent Crime (NCAVC) within the FBI (Depue, 1986).

## Criminal Investigative Analysis

Criminal investigative analysis is a term coined to differentiate "psychological profiling" from "criminal personality profiling," (Hazelwood, Ressler, Depue & Douglas,

1995), that has appeared in the literature with discussions of its theoretical basis and methodologies (Hazelwood, Dietz & Burgess, 1982; Douglas & Burgess, 1986; Icove, 1986). Criminal investigative analysis is an investigative aid used to help solve complex, bizarre, or repetitive violent crimes (Douglas and Burgess, 1986; Douglas, Ressler, Burgess & Hartman, 1986; Geberth, 1996). Criminal investigative analysis is a tool that "focuses on individual-level case data, examines the behavior exhibited within each crime scene, and facilitates the identification of the major personality and behavioral characteristics of the offender" (Douglas, et al., 1992, p. 310). The goal of criminal investigative analysis is to prioritize suspects and provide information of lead value to case investigators by inferring offender characteristics from offense characteristics (Rossmo, 2000). Jackson & Bekerian (1997) describe a profile as being "based on the premise that the proper interpretation of crime scene evidence can indicate the personality type of the individuals(s) who committed the offence." (p. 3). The methodologies employed by profilers have been the topic of much scrutiny and debate, as will be seen in the review of the literature (Chapter II). Of particular concern is the development and application of various offender typologies and profiling strategies used to answer three fundamental questions inherent in any criminal investigation:

1. What happened during the commission of the crime?
2. Why did the events happen?
3. What type of person would have committed the crime? (Rossmo, 2000)

The profiling methodology employed by the FBI at the NCAVC is the principal one in use within the United States and by a number of law enforcement agencies abroad.

The generation of a profile is based upon a study of victim attributes and offender behaviors. Offender behaviors may be observed in the methodology of the crime known as the *modus operandi* (MO), the physical evidence at the crime scene(s), and the choices made by the offender while selecting the victim and committing the crime (Douglas, Ressler, Burgess, & Hartman, 1986; Geberth, 1996; Knight, Warren, Reboussin, & Soley, 1998; Safarik, Jarvis, & Nussbaum, 2000). Identifying the various behaviors, analyzing the information, and producing the profile, follows the model proposed by Ressler, Burgess, & Douglas (1988). This "criminal profile generating process" (p. 136) begins with a series of "inputs," generally from investigative and forensic reports containing detailed information about the victim, the crime scene, results of forensic testing, crime scene photographs, and the results of the police investigation. In the subsequent "decision process," the analyst draws inferences about the type and style of crime, the intent of the offender, victim and offender risk factors, and the importance of the time and place of the offense from the case information. The analyst then subjectively and qualitatively weighs the inference against an assessment of the behaviors exhibited by the offender and the victim along with a reconstruction of the sequence of events occurring during the crime. These behaviors are classified as having organized or disorganized characteristics.

Ressler, Burgess, Douglas, Hartman, & D'Agostino (1986) used the organized/disorganized classification to distinguish the behaviors observed in the crime scenes of 36 serial killers. The organized offender exhibits a higher degree of planning in

the commission of the crime that also appears in other aspects of his non-criminal behavior and lifestyle. The disorganized offender displays little planning with behaviors analogous to an impulsive individual of lower intelligence, rather than one who plans his actions. This taxonomy, with the addition of demographic and offense history information provides an offender typology which, when compared with the instant offense, serves as the basis for the fourth stage of the criminal investigative analysis process – generating the criminal profile. This fourth stage should include a description of offender demographics, physical characteristics, habits, pre and post-offense behavior, and investigative recommendations (Ressler, Burgess, & Douglas, 1988, p. 145).

Since the FBI's incipient serial killer study (Ressler, Burgess, Douglas, Hartman, & D'Agostino, 1986; Ressler & Burgess, 1985), taxonomies have been developed for disparate offender groups utilizing the offender organizational model. The taxonomies include those for various types of murderers (Canter & Heritage, 1990; Ressler, Burgess & Douglas, 1988), rapists (Hazelwood & Warren, 1990; Hazelwood, et al., 1995; Warren et al., 1999), arsonists (Rider, 1993; Sapp, Huff, Gary & Icove, 1995; Sapp, et al., 1996; Kocis, Irwin, & Hayes, 1998), and bombers (Sapp, Huff, Kelm, & Tunkel, 2001). However, little has been done to validate the organized/disorganized taxonomy, a critical element in the FBI's criminal profile generating process, in spite of continuing criticism about the lack of empirical support for this approach (Canter & Alison, 2000; Jackson & Bekerian, 1997; Holmes & Holmes, 1996; Godwin, 2000).

Applying the Model to Bombing Offenders

Offender behavioral organization, described as an “organized/disorganized dichotomy” (Ressler, et al., 1986), is the description of a criminal offender’s behaviors, and subsequently his behaviors observable in his everyday life when not committing crimes. This information can provide a useful tool for law enforcement to narrow the suspect pool. Describing criminal behavior as organized or disorganized is central to the methodology employed by the majority of profilers in the world today, particularly in cases of serial homicide and rape (Rossmo, 2000).

The purpose of this study is to examine the utility of the organized/disorganized taxonomy as it is applied to bombers using selected crime scene characteristics related to offender organization. Bombers have been described, by the very nature of the offense, as offenders who calculate and plan their crimes (Douglas & Olshaker, 1995). The time between deciding to commit the crime and the bombing is taken up with designing the device, obtaining the components, assembling the bomb, and delivering it to the target. It is axiomatic that a bomb is an inherently dangerous weapon (Brodie, 1996; Brown, 1998). As one profiler opined, a careless (disorganized) bomber has a short "shelf-life” (R.F. Tunkel, personal communication, January 19, 1999). Despite the anticipated necessity to be more highly organized than other offenders, degrees of observable variability in the bomber’s criminal behavior could be expected when examined in the context of the offender organizational model.

# CHAPTER II

## Literature Review

### Offender Organization

Origins of the organized/disorganized dichotomy. Hazelwood and Douglas (1980), described the characteristics of the "Lust Murderer;" a sexually motivated murderer whose offenses are characterized by exceptionally violent mutilation and torture of the victim (de River, 1950). The lust murderer is consumed by violent sexual fantasies that he attempts to recreate during the course of a sexual homicide. Hazelwood and Douglas (1980) described two types: the Organized Nonsocial and the Disorganized Asocial. The Organized Nonsocial demonstrates psychopathic characteristics, but is able to function in society despite disliking people in general. He manipulates people, including his victims, by an outward congenial display. His crimes are "methodical and cunning" (Hazelwood & Douglas, 1980, p.18).

The Disorganized Asocial lust murderer displays characteristics of the true "loner." This offender finds interpersonal relationships difficult, at best, resulting in feelings of rejection and loneliness. The murders he commits are frenzied and more likely to be impulsive. The type of offender may be differentiated by characteristics of the crime including body location, antemortem or postmortem mutilation or torture, blood smearing, penis penetration, anthropophagy, and the presence or lack of physical evidence at the crime scene.

In the late 1970s, instructors at the FBI Academy described criminal behavior and personalities with diagnostic terms used by mental health professionals (K. Lanning, personal communication, November 20, 2002). The terms "Organized Nonsocial" and "Disorganized Asocial" were adopted by Hazelwood and Douglas (1980) to describe offender characteristics consistent with those exhibited by psychopathic personalities and those suffering from paranoid schizophrenia respectively (R. R. Hazelwood, personal communication, November 20, 2002). The authors felt the terms would be helpful explaining criminal behavior in a way that was easily understood by law enforcement personnel and avoided clinical jargon.

Research supporting the offender organization model. In an exploratory study of 36 serial killers, Ressler and Burgess (1985) discussed the crime scene and behavioral characteristics of sexual killers in more detail. Describing the organized/disorganized dichotomy, FBI profilers identified a series of offender characteristics (Figure 2.1) and offense characteristics (Figure 2.2) for both organized and disorganized offenders. The organized/disorganized dichotomy is based upon the offender's ability to think ahead and plan his offense. Therefore, an organized offender demonstrates control and cognizance of incriminating evidence in the crime scene, whereas the disorganized offender has little control, leaving crucial evidence to be discovered.

Based upon the analysis of the crime scene, the organized/disorganized taxonomy diverged from more traditional analyses of sexual homicides resulting from an evaluation of perceived victim provocation or precipitating factors. The organized/disorganized

Figure 2.1. Organized/disorganized crime characteristics.

| ORGANIZED OFFENDER | DISORGANIZED OFFENDER |
|---|---|
| Plans the offense | Acts on impulse |
| Victim is a targeted stranger | Victim/location known |
| Personalizes victim | Depersonalizes the victim |
| Controlled/scripted conversation | Minimal conversation – orders |
| Crime scene reflects control | Crime scene random/sloppy |
| Demands victim be submissive | Sudden violence to victim |
| Restraints brought to scene/used | Minimal restraints/available at scene |
| Aggressive acts antemortem | Necrophilia |
| Body hidden/disposed | Body left in view |
| Weapon /evidence taken away | Weapon/evidence left at scene |
| Transport victim/body (vehicle) | Body left at scene (no vehicle) |

Source: Ressler & Burgess (1985) p. 19.

approach views the crime from the offender's perspective following an analysis of observable offender behavioral clues.

Describing the FBI research in more detail, Ressler, Burgess, Douglas, Hartman, & D'Agostino (1986), found t-test variable significance at the .05 level for the offense

Figure 2.2 Organized/disorganized offender characteristics.

| ORGANIZED OFFENDER | DISORGANIZED OFFENDER |
|---|---|
| Intelligent | Below average intelligence |
| Socially competent | Socially inadequate |
| Skilled work | Unskilled work |
| Sexually competent | Sexually inhibited, sexually naïve |
| High birth order | Low birth order |
| Father's work stable | Father's work unstable |
| Inconsistent childhood discipline | Harsh discipline as a child |
| Controlled mood during crime | Anxious mood during crime |
| Use of alcohol with crime | Minimal use of alcohol |
| Precipitating situational stress | Minimal situational stress |
| Living with partner | Living alone |
| Mobility with good car | Lives/works near crime scene |
| Follows crime in media | Minimal interest in news media |
| Change jobs or leave town after murder | Significant behavior change (drugs, alcohol abuse, religiosity) |

Source: Ressler & Burgess (1985) p. 19.

and offender characteristics previously described (Ressler & Burgess, 1985). The study (Ressler, et al., 1986) concluded that objectively quantifiable patterns exist in crime scenes to differentiate between organized and disorganized sexual murderers. This generalization came with the caveat that the organized/disorganized types were not mutually exclusive as each of the 36 sexual murderers studied were capable of exhibiting any of the behaviors described.

The Crime Classification Manual (Douglas, Burgess, Burgess, & Ressler, 1992) briefly described the organized/disorganized typology within the context of the process of classifying a crime using the framework suggested in the manual. The manual was intended:

> "1. To standardize terminology within the criminal justice field
> 2. To facilitate communication within the criminal justice field and between criminal justice and mental health
> 3. To educate the criminal justice system and the public at large to the types of crimes being committed
> 4. To develop a data base for investigative research" (p. ix-x).

Geberth (1996) described the organized/disorganized typology as "excellent descriptions of human behaviors as they relate to the characteristics of sex-related murderers" (p. 729). He cautioned that offenders may present a "mixed" profile with both organized and disorganized behaviors present in the crime scene. Geberth suggested the classifications have some utility for law enforcement investigators to make an initial assessment of the crime scene in order to focus investigative resources at the earliest stages of an investigation. Geberth commented that a detailed description of the

organized and disorganized characteristics and their relationship to the behavioral make-up of the offender should be left to the criminal profiler.

Ressler, Burgess & Douglas (1988) reprised the original serial murder study findings (Ressler, et al., 1986) and provided extensive offender profile and crime scene characteristics. They concluded the following about organized offenders. The organized offender tends to have a high birth order with inconsistent parental discipline. The offender's father has a stable work pattern that is not mirrored by the offender who is frequently underemployed at a skilled occupation with an uneven work history. He has an above average intelligence quotient (IQ) inconsistent with his employment. The organized offender often has a precipitating situational stress. He is socially adept and usually lives with a "significant other." This offender has a car in good condition. He may use alcohol before the offense and, although he is reportedly angry or depressed at the time of the murder, he is calm or relaxed during the actual commission of the crime.

The organized offender's crime scene reflects planning and control. The scene suggests order before, during and after the murder with efforts taken to avoid detection. The victim is frequently one of opportunity – the result of a conjunction between the offender and a suitable victim in time and place. Oftentimes, the offender searches for a victim because the victim exhibits certain characteristics that appeal to the offender's fantasy based desires. The organized offender is able to function socially and does not appear suspicious, dressing neatly or wearing clothing designed to misdirect and gain the confidence of the victim (uniform, business suit). This type of offender uses conversation, deception or diversion to gain control of the victim thereby reducing the

need for physical violence that may call attention to the offender. The organized offender uses weapons, restraints, and sexual torture implements that he brings to the scene, as part of an overall plan of assault.

The organized offender demonstrates obsessive, compulsive traits. He frequently fantasizes about his crimes and engages in ritualistic behavior. This offender is aware of forensic evidence. He takes pains to remove evidence, including the body, from the crime scene.

Ressler, Burgess & Douglas (1988) described the disorganized offender as a person of below average intelligence and low birth order. This offender reports harsh parental discipline and a poor work history that mirrors his parents own work habits. He is confused or distressed at the time of the crime. Socially inadequate, he usually is single, living alone or with a parental figure. He is sexually incompetent and, although claiming to be heterosexual, he is more likely to be sexually ignorant with little or no experience. He lives in close proximity to the crime scene and has unreliable transportation. When stressed, the disorganized offender acts impulsively.

The disorganized offender's crime scene appears to be the result of little or no planning. There is minimal indication of evidence consciousness with the scene left in great disarray and evidence linking the offender to the crime scene being present. The victim may be known to the offender, but he or she is likely to be selected based upon availability as opposed to any other criteria. Consequently, the offender usually has easy access to the victim and uses a blitz style of attack to gain immediate control. Frequently the victim is killed in the initial attack with the result being sexual activity with the

victim, if any, is post-mortem. This sexual activity may take on a bizarre or aberrant character. The offender may attempt to ejaculate into stab wounds, urinate, ejaculate or defecate in or around the body, and engage in mutilation of the face, breasts and genitalia. The disorganized offender's death scene and body dumpsite are often the same. The offender makes no effort to conceal the body. If a murder weapon is used, it may have been obtained at the scene and is left there after the crime. As the literature indicates, for the purpose of establishing a common frame of reference in describing criminal offender behavior, the organized and disorganized labels are sufficiently objective and understandable constructs for use by law enforcement officers.

Reviews of the organized/disorganized model. Rossmo (2000) acknowledges the difference between the "ideal (organized/disorganized) dichotomy" and the reality that most offenders have some diversity in their behaviors and lifestyle (p. 71). Noting the prevalence of the organized/disorganized categorization in the area of offender profiling, Rossmo cites subsequent research (Homant & Kennedy, 1998; Kocsis, et al., 1998) that demonstrated a correlation between the offender organization typology and offender characteristics allowing for reliable assessments of crimes.

Godwin (2000) criticized the FBI organizational model primarily as a dichotomy that is not mutually exclusive and allows for characteristics of both organized and disorganized behavior to be present in the same offender. He also objects to the lack of a single explanation for the differences between the organized and disorganized serial murderer. Godwin interprets the differences in terms of psycho-dynamic drive; e.g. revenge and sadism. Godwin cites the work of Busch and Cavanaugh (1986) to support

his contention that the FBI model lacks validity for several reasons. First, the model is based upon unfounded statements not supported by data collection; and second, the model is based upon unevaluated case reports without rigorous evaluation of other contributory factors. Further, the FBI model is weak because it is descriptive and not generalizable to the full population of serial murderers at large and it is based upon ad hoc data and a small sample size resulting in biases confirming assumptions made by the researchers.

Turvey (1999) terms the FBI organizational model a "false dichotomy." Extrapolating from Ressler, Burgess & Douglas (1988)[2], Turvey classifies organized crime scene and offender characteristics as "psychopathic" and the disorganized characteristic as "psychotic." Unfortunately, he offers no basis for his inference. He notes that the model is not dichotomous in that crime scene and offender behaviors will appear somewhere between the poles of organized and disorganized – more approximately a continuum. Another criticism of Turvey's assumes a failure by criminal profilers to account for the offender refining his MO over the course of his criminal career when applying the model. Strangely, however, Turvey decries an assumed reliance upon MO as opposed to signature as criteria for characterizing the offense as either organized or disorganized.

What should be noted in these critiques of the organizational model is the failure

2 Turvey improperly refers to "Burgess, et al. (1988)" at page 146, but cites the work correctly in his references.

Of each author (Godwin, 2000; Busch & Cavanaugh, 1986; Turvey, 1999) to examine the peer-reviewed study (Ressler, Burgess, Douglas, Hartman, & D'Agostino, 1986) wherein the original data analysis was available for review. Each of these authors, in their turn, examined narrative descriptions of the model that appeared in the Crime Classification Manual (Douglas, et al., 1992), Sexual Homicide: Patterns and Motives (Ressler, Burgess, & Douglas, 1988), and several articles in the FBI Law Enforcement Bulletin (December, 1986). None of these works was published as empirical peer-reviewed study, rather each was intended to provide educational and investigative assistance to the law enforcement and criminal justice communities. Some of the critics concerns may have been allayed by a more thorough review of the literature.

Kocsis, Irwin, and Hayes (1998) considered the complete FBI study (Ressler, et al., 1986) in detail, however. They found several problems with the methodology without discounting the concept or conclusions reached. Their first concern is directed towards the statistical comparisons used in the FBI study. Over sixty univariate t-tests were conducted with no correction for the number of tests conducted, thereby calling the reliability of the tests into question. Secondly, profilers in the Behavioral Science Unit used an unknown methodology to separate the offenders in two groups, organized and disorganized. This selection process apparently applied the same concept of organized/disorganized that the FBI study was attempting to validate – what Kocsis, et al. (1998) describe as a "self-fulfilling prophecy" (pg. 7). The FBI study, designed to validate the organizational model, should have demonstrated the natural occurrence of organized or disorganized behavior in the case evidence as opposed to selecting

characteristics demonstrating one or the other after the case has been classified as either organized or disorganized.

Validating the model. Kocsis, Irwin, and Hayes (1998), following their criticisms of the original study methodology, validated the organizational model by comparing two disparate populations of fire setters. The study used archival records. Demographic and crime scene characteristics, derived from the Crime Classification Manual (Douglas, et al., 1992), were coded for arsonists identified as being either vandalism or profit motivated.

Fourteen crime scene characteristics were compared to offender demographic characteristics for the two study groups - vandalism and arson for profit. The study found a positive correlation between arson for profit (organized) fire setting behavior (use of ignitable liquids brought to the scene, multiple fire sets, deliberate target selection, effective damage, lack of physical evidence) and organized offender characteristics (good grooming, financial stability, emotional stability, positive relationships). The vandalism group (disorganized) showed similar relationships between disorganized crime scene indicators (available combustible materials, random targets close to residence, haphazard damage, physical evidence present) and disorganized offender characteristics (slovenly appearance, poor socialization). The study demonstrates the utility of imposing the organizational model on crime scene characteristics to infer offender characteristics.

The researchers did assign cases to either the organized (arson for profit) or disorganized (vandalism) category a priori, however. This may present a problem with the validity of the study, since the authors did not objectively operationalize these two

categories. Additionally, Kocsis, et al. (1998) used the detectives who originally investigated the arson cases to code data related to the demographic and crime scene characteristics. Due to limitations on the amount of time the investigators could commit to the study, the researchers were unable to assess the reliability of the coding process.

Bombers and their Motivation

Sapp, et al. (2001) noted the paucity of literature on bombers. Overall, it is anecdotal with case studies of individual bombings or bombers, or consists of technical material on bomb construction, the chemistry and use of energetic materials, and bomb squad equipment and tactics. There have been several attempts to develop typologies or offer descriptions of different personalities and motivations of bombers (Brussel, 1968; MacDonald, 1977; McCree, 1986; Dietz, 1987; Douglas and Olshaker, 1995, 1996, 1999; Meloy & McEllistrem, 1998) all varying in methods, definition of terms, and lacking empirical validation.

Brussel's (1968) popular narration of significant cases from his career as a psychiatrist, described the activities of George Metesky who, nicknamed "Mr. Think" by his neighbors, earned the appellation "Mad Bomber of New York" for his sixteen year bombing campaign. Brussel diagnosed the bomber, and ultimately Metesky, as a narcissistic paranoiac who was meticulous, neat, intelligent, and socially isolated.

MacDonald (1977) clinically interviewed 30 bombers in his position as a prison psychiatrist in Colorado. He developed a typology, consisting of six bomber archetypes, based upon anecdotal and experiential information from those interviews. MacDonald

did note, however, that “There is no single personality type. The personalities of bombers are as varied as their explosive devices.” (p. 38).

According to MacDonald, bombers may display a range of behaviors related to organization. One type, the compulsive bomber is neat and something of a perfectionist, often taking additional steps unnecessary to the successful completion of the bomb, but satisfying the bomber’s emotional need or desire to combine an ingenious design with fastidious construction. Conversely, other bombers take incredible risks, such as smoking while handling explosive powders or using tools likely to cause sparks, or fail to use common sense in the design of the bomb resulting in many bomber injuries and fatalities. As noted, this work, which contains no citations or references, was based upon MacDonald’s professional experience, not empirical research.

McCree (1986), basing his conclusions upon his extensive experience as commander of the Los Angeles Police bomb squad, not empirical data, offered a complex bomber typology and an analysis of their motives. McCree described bombers based upon their relative skill in constructing bombs. The *Amateur* bomber displays basic self-taught ability indicative of a temporary preoccupation or interest. Juveniles engaged in vandalism or experimentation would accurately serve as examples of this type. These bombers display a low level of planning, act in a group, collectively construct the bomb and walk to the target. They do not reconnoiter the target selecting targets of opportunity known to them (mailboxes, schools, phone booth, etc.). *Amateur* bombers place the bomb in an ineffective location and run away with a notable lack of distance between

themselves and the bomb, sometimes resulting in self-victimization. The group talks openly about their exploits and leaves evidence of their offense

McCree's *Sub-Professional* bombers are generally self-taught as well, but may have had some training using military field manuals or underground publications. These bombing offenders plan well and place the device in areas intended to maximize destruction, usually with a high degree of success. The bomb is the weapon of choice selected to accomplish the bomber's objectives. This category of bomber would include most criminal bombing offenders.

McCree's *Professional* bomber is the most highly trained and organized offender. He thinks professionally at all times and prefers to work alone. This offender is a contract killer or mercenary who places the bomb in a precise location according to a timetable.

McCree (1986) suggests bombers may progress from one category to the next achieving "upward mobility" as they attain additional knowledge and skill. Other bombers may remain at one level.

Dietz (1987) describes two types of "repetitive" bombers of psychiatric interest. Dietz conceptualizes the *Delusional* bomber is one "whose motives are based in delusions, which, if true, would be grounds for animosity, a desire for revenge, or other motives found in non-psychotic bombers." (p. 486). Similarly, Dietz' *Obsessive-Compulsive* bombers exhibit psychopathology common to all those obsessed with explosives and they occasionally report sexual or emotional gratification because of their bomb activities. Dietz does not believe obsessive-compulsive psychopathology

adequately explains why some of those who are fascinated with explosives actually construct and detonate a bomb, however. Other factors, such as sociopathy, intoxication, life stress, or intense emotional states, when combined with an obsessive-compulsive disorder, convert interest into action.

Douglas and Olshaker, in the popular work Mind Hunter (1995), describe bombers as *power-motivated*, *mission-motivated,* and *technically oriented* bombers. *Power-motivated* bombers are attracted to the destruction of their devices while the *mission-motivated* bombers are excited by designing, making, and placing the devices. *Technically oriented* bombers are gratified by their self-perceived genius in the design and construction of the bomb. Bombing motives include extortion, labor disputes, revenge, and suicide. The bomber profile is that of a white male whose age is determined by the victim or target. Bombers have average intelligence (many are above average), but tend to be underachievers. They are neat, orderly, and meticulous and usually exhibit careful planning in their offenses. Bombers can be described as inadequate personalities, who are non-athletic, cowardly, and nonconformists.

In two other popular works, Douglas and Olshaker (1996, 1999) include criminal enterprise, a personal cause, a group cause, a psychologically disorganized individual, or a mix of these elements as motivations for bombings. Some power-motivated offenders derive a sense of power by causing a response to the bombing by public safety personnel and the public. The *psychologically disorganized* bomber includes juvenile offenders, those who are under the influence of alcohol or drugs, mentally unstable individuals and bombers who are inexperienced or criminally unsophisticated

Meloy and McEllistrem (1997) reviewed the literature about bombers and noted the small number of articles that exist, are anecdotal, consisting mostly of case histories of individual offenders. To identify bombing offender characteristics, the authors reviewed news articles, court transcripts, and popular accounts of bombings. The characteristics were then compared with factors comprising aggressive narcissism and chronic antisocial behavior as measured using the Psychopathy Checklist-Revised (Hare, 1998). The study found concordance between the perceived bomber traits and psychopathic descriptors. Recognizing the lack of empirical testing in any of the literature, including their article, Meloy and McEllistrem (1998) suggested immediate funding for a research study on the behavioral characteristics of bombers by the NCAVC.

Empirical study of bomb related offenders. Sapp, Huff, Kelm and Tunkel (2001) interviewed and collected information on fifty bomb-related[3] offenders, primarily in the California prison system. The descriptive study identified demographic and personal history characteristics of the offenders as well as offense characteristics. The authors focused on bomber motivation, identifying nine motives common in all of the literature. The motives are: experimentation, vandalism, excitement, revenge, ideology, criminal enterprise, diversion or distraction, mentally disordered, and a catchall motivation labeled "mixed."

The study results reflected a diverse offender population that mirrors the racial

3 The study included bomb related crimes such as making bomb threats and bomb hoaxes. All of the participants made or delivered bombs in addition to the few who made bomb threats or hoax bombs.

makeup of the United States. All of the offenders were males, however the authors noted they only interviewed in male institutions. Approximately 40% of the study population did have a mental health history comprised mainly of psychoses, personality and mood disorders. The offenders in this study had substantial criminal histories with an average of six arrests apiece for both felony and misdemeanor offenses.

Sapp, et al. (2001) found a broad range of offense behavior. Many of the offenders (32%) constructed bombs before age 19 with an average age for making their first bomb of 23.4 years. The authors noted these offenders were not impulsive – the average time taken to plan their activity was twenty-one days. Approximately 64% of the offenders reported some form of formal or informal training making bombs. Thirty-two percent (32%) of the offenders admitted to actually targeting specific persons with the intent to harm or kill the intended victim.

The results of this study should be viewed with some caution, as the population (fifty) is small. The data is based substantially upon self-reports by the offenders as well. Furthermore, the study did not include psychological, physiological and neuro-psychological testing, specifically the PCL-R, MMPI, and Rorschach, as suggested by Meloy and McEllistrem (1998).

Conclusions. The offender organizational model has utility describing the offense and non-offense behavior, traits, and characteristics of criminals in the development of a profile. Although supporting the model, previous research has not conclusively demonstrated its validity leaving the concept open to criticism. Previous attempts to validate the model have been based in circular logic that has exposed the concept to

criticism. Additionally, the paucity of literature related to criminal bombers, based upon weak anecdotal descriptions of bomber behavior, provides only nascent offender typologies that are of little use in criminal profiling. Application of the offender organizational model requires some assurance of its validity and reliability to demonstrate its utility in the course of criminal investigations. Using the previous studies of offender organization as a framework, the methodology of this study is designed to address concerns about the model's validity as well as apply the concept to the behavior of bombing offenders.

# Chapter III

## Methods

This comparative study will attempt to determine if there is a correlation between bombing crime scene evidence characteristics and bomber organizational traits. The study is retrospective and will examine data collected from a previous study of bombers (Sapp, et al., 2001). This sample data is secondary data, extracted from existing data supplied by the Federal Bureau of Investigation (FBI). It contains no personal identifying information. Acquisition of this data did not involve live subject interviews. Since this data represented existing data, contained no identifying information, and no face-to-face interviews were conducted, institutional review board approval for the study was not required by the FBI or Virginia Commonwealth University.

Since 1986, the Arson and Bombing Investigative Services (ABIS) sub-unit of the FBI's National Center for the Analysis of Violent Crime (NCAVC) located in Quantico, Virginia, has engaged in research in the area of arson crimes. The ABIS sub-unit, staffed by personnel from ATF and the FBI, has produced a number of studies of criminal fire setters and serial arsonists (Icove & Estepp, 1987; Icove & Gilman, 1989; Icove & Horbert, 1990; Huff, 1993; Sapp, Gary, Huff, Icove & James, 1993; Sapp, Gary, Huff & James, 1994; Huff, 1994; Sapp, Huff, Gary, Icove & Horbert, 1994; Ritchie & Huff, 1999).

In addition to the arson studies, the NCAVC (ABIS) conducted a non-experimental exploratory study of convicted bomb related offenders (Sapp, Huff, Kelm & Tunkel, 2001). The research instrument utilized in this study was an adaptation of the questionnaire used in the 1995 NCAVC arson study (Sapp, et al.). That questionnaire proved effective in collecting data for the initial arson study as well as a study resulting in a motive based offender typology of serial arsonists (Sapp, Huff, Gary, & Icove, 1995). The instrument used in the bomb study consisted of four parts that collected detailed information about the personal history and socialization of the offender participant, offense histories of participants who made bomb threats, offense histories of participants who made hoax bombs, and offense histories of participants who actually possessed, manufactured or employed explosives. This study will use two parts of the instrument; Section I related to offender demographic information, and Section IV related to actual bombing offenses. Both sections are included as an appendix to this study.

The NCAVC study was the first systematic compilation of bomb related offender data utilizing quantitative methods, not anecdotal accounts or individual case studies. The above described research instrument was used to collect data for fifty cases on over 460 discrete variables. The coded data from that study, containing no personal identifying information of the study participants, has been made available by the NCAVC for use in this thesis.

Sample

The study selected as the data source for this study (Sapp, et al., 2001) used the following sampling procedures. The target population included all persons convicted of

explosive law violations and currently under correctional supervision in the state of California along with several participants from Virginia and Texas. California was selected as the primary source of the study population as it reliably reflects explosive incident offense rates for the United States as depicted in Table 3. The Virginia and Texas inmates were used to test the instrument with those states selected for the convenience of the interviewers.

Table 3.1. Selected explosives incident offense rates

| STATE | 1990 POPULATION | EXPLOSIVES INCIDENTS 1993-1997 | RATE PER 100,000 POP. |
|---|---|---|---|
| AZ | 3,665,228 | 969 | 26.9 |
| IL | 11,430,602 | 1961 | 17.2 |
| CA | 29,760,021 | 4800 | 16.1 |
| FL | 12,937,926 | 1882 | 14.6 |
| TX | 16,986,510 | 1238 | 7.3 |
| PA | 11,881,643 | 758 | 6.4 |
| NY | 17,990,455 | 979 | 5.4 |
| VA | 6,187,358 | 394 | 2.6 |
| US | 248,709,873 | 41,250 | 16.6 |

Source: U.S. Census Bureau, (1990) and Bureau of Alcohol, Tobacco and Firearms, (1997).

Each state Department of Corrections (DOC) provided a roster of inmates currently incarcerated for explosive law violations and the institution where they were located. This sampling frame quickly identified potential populations of individuals suitable for interview. Sapp, et al. (1995) demonstrated the sufficiency of such a sample for the purpose of producing a typology for criminal investigative analysis involving serial arsonists.

Non-probability sampling was used to select individuals from the lists generated by the DOC who met the study criteria. Each offender's prison record was reviewed to establish the facts of the offense resulting in the current incarceration. In some cases, the conviction charge did not necessarily reflect the actual circumstances of the offense. This occurred as a result of plea-bargaining or amalgamation of offense behavior under one statute. Consequently, some inmates were rejected from inclusion in the bomber study. For example, an offender included in the DOC sampling frame might be classified by the state as a "bomber" for using an incendiary device, such as a Molotov cocktail. Using such a device was not operationally defined as an explosive device in the study. In that case, the offender was re-classified as an arsonist and excluded from inclusion in the bomber study population. Purposive sampling ensured that the sample population included offenders convicted of appropriate explosives or bombing related offenses defined in the study. The subjects participating in the study committed their offenses between 1981 and 1999. The data used in this thesis consists of the previously coded bombing questionnaire responses that have been provided in a format compatible with SPSS.

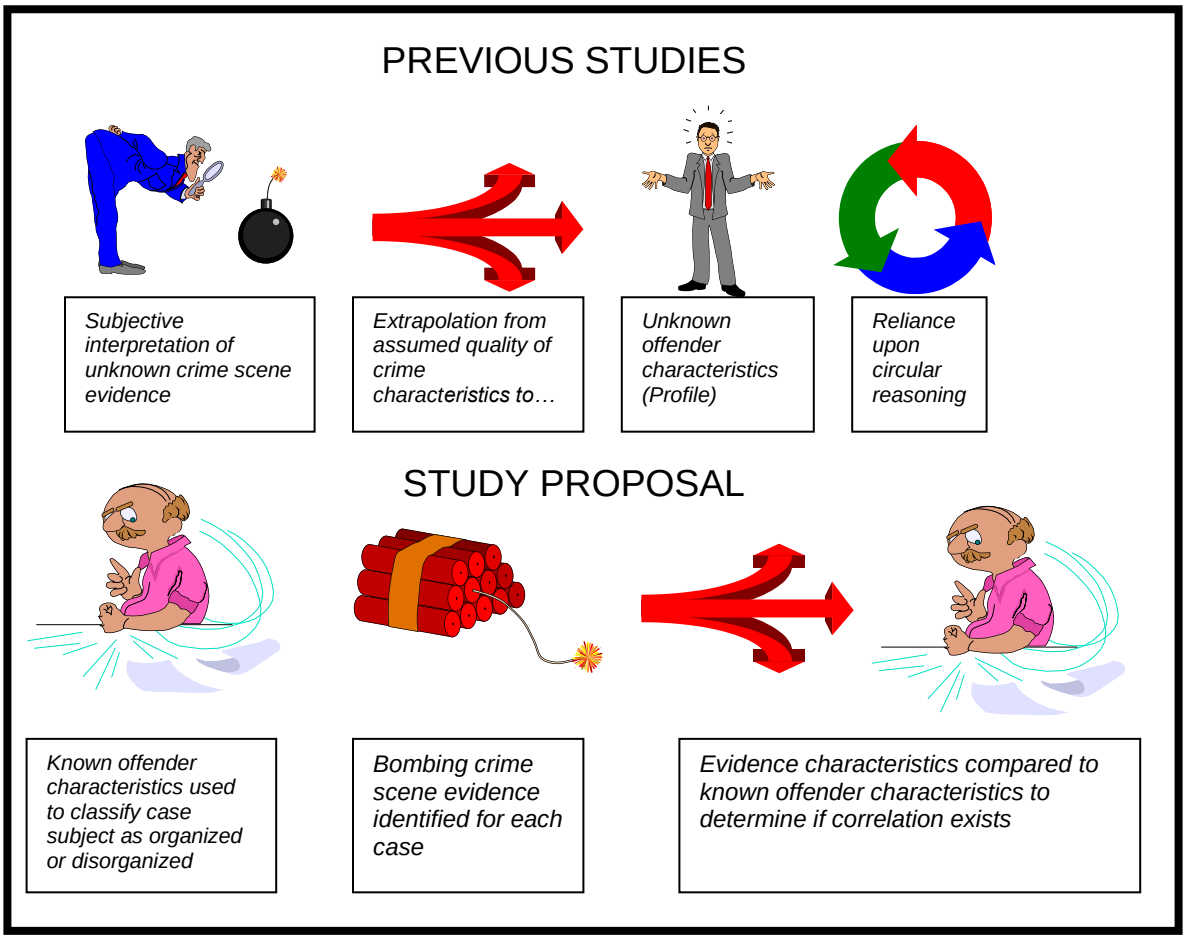
Design and Procedures

Previous studies of characteristics associated with the FBI behavioral organization model (Ressler & Burgess, 1985; Ressler, et al. 1986; Kocsis et al., 1998) had identifiable flaws in their methodologies (Busch & Cavanaugh, 1986; Turvey, 1999; Godwin, 2000). In each case, there has been some dependence in the study design upon a subjective evaluation of crime scene characteristics as either organized or disorganized. These

characteristics were then compared to personality traits of the offender sample to determine if a correlation existed between the offender and crime scene characteristics. A label of organized or disorganized was then assigned to the offender sample. The previously employed methodology is flawed because it attempts to extrapolate unknown characteristics (offender profile) from unknown offense characteristics (subjectively labeled evidence). This study proposes to remedy this threat to validity by reversing the order of analysis and by using objective quantifiable criteria to establish organized and disorganized classifications for the participants. For each case, known offender personality traits, characteristics, and demographic information will be used to classify each study subject as an organized or disorganized individual. Selected offense behavior indicated by crime scene evidence, that would be observable by investigators at the scene of a bombing, will be compared against the offender's known "profile" to determine if that profile has any correlation to the crime scene evidence. The differences are illustrated in Figure 3.1.

Independent variable: organized and disorganized offenders. Violent offenders may be differentiated by the relative level of organization in their life skills (Hazelwood & Douglas, 1980; Ressler & Burgess, 1985; Ressler, et al., 1986; Geberth, 1996; Ressler, et al. 1988; Rossmo, 2000). Central to all of these discussions is the offender's ability to think, to plan, and exert control over his environment. Some of the factors affecting this ability are intelligence, impulsiveness, relative socialization, and employment.

Figure 3.1. Comparison of study designs – previous vs. current study


PREVIOUS STUDIES
Subjective interpretation of unknown crime scene evidence
Extrapolation from assumed quality of crime characteristics to…
Unknown offender characteristics (Profile)
Reliance upon circular reasoning
STUDY PROPOSAL
Known offender characteristics used to classify case subject as organized or disorganized
Bombing crime scene evidence identified for each case
Evidence characteristics compared to known offender characteristics to determine if correlation exists

This study will classify bombers as either organized or disorganized based upon personality and demographic traits present in the sample. The independent variable, labeled "Offender Organization," will consist of two values, organized and disorganized. A set of eight sub-variables, consisting of characteristics consistent with those used in the NCAVC serial murder study (Ressler & Burgess, 1985; Ressler, et al., 1986) and the Australian arsonist study (Kocsis, et al., 1998), will be used to categorize each offender as organized or disorganized. Each sub-variable will be reduced to nominal data

reflecting either the organized or the disorganized value. An aggregate of the eight variables will then be used to categorize each offender as tending towards being either an organized or a disorganized individual. Those subjects having five or more of the eight sub-variables categorized as either organized or disorganized will be used for further analysis with a corresponding organized or disorganized value.

The variables from the NCAVC bomber study (Sapp, et al. 2001) that will be used to create the independent variable, Offender Organization, are:

*Offender age (at time of offense)*
*Marital history*
*Living with someone at time of offense*
*Loner*
*Highest school grade completed*
*Job stability*
*Economic status*
*Time to Ponder*

Age reflects the level of maturity and criminal sophistication of the offender. Hare (1981) assessed a population of 200 inmates using global clinical ratings of psychopathy. The mean age of first arrest was 18.1 for psychopaths and 20 for non-psychopaths. The ATF Arson & Explosives Incident System (AEXIS) has compiled information from over 120,000 bombings since 1977. The data suggests immature motivation for criminal bombings up to the age of 24. Those bombings, where vandalism or non-specific targeting suggests experimentation, comprise over 50% of the bombings in the ATF database (Bureau of Alcohol, Tobacco and Firearms, 2002). For the purpose of this study, offenders under the age of 21 (median of 18-24) will be classified as disorganized while those 21 and over will be classified as organized.

Previous studies (Ressler & Burgess, 1985; Ressler, et al., 1986; Ressler, et al., 1988; Kocsis, et al., 1998) indicate organized offenders are socially adept and usually live with a spouse or partner. *Marital history*, who the offender was *living with* at the time of the offense, and whether or not the offender labels himself as a *"loner"* will be used to classify subjects as organized or disorganized in the area of socialization. Those subjects claiming a prior formalized relationship (married, divorced) will be classified as organized and those claiming multiple marriages or having never been married will be coded as disorganized. Those offenders living with a female roommate, spouse or spouse and children will be considered organized while those adult offenders living alone or with their parents will be labeled disorganized. Subjects who described themselves as a loner will be classified as disorganized.

Organized offenders generally have an average to above average intelligence and, therefore, should perform at a higher level resulting in greater success in their education. Disorganized offenders, on the other hand, demonstrate below average intelligence and do not perform as well in school, oftentimes failing to complete a high school education (Ressler & Burgess, 1985; Ressler, et al., 1986; Ressler, et al., 1988; Kocsis, et al., 1998). The variable *Highest School Grade Completed* will measure this area of personal organization. Subjects who have completed at least 12 years (high school) of education will be coded as organized while those who do not complete high school will be coded as disorganized.

An organized individual, being socially adept and having above average intelligence with an education, could reasonably be expected to have stable employment

producing a livable income. This will be measured using the variables *Job Stability* and *Economic Status*. Subjects were asked to rate their relative job stability as follows:

> "_____ Job Stability
> (1) Generally stable-usually employed
> (2) Unstable-frequent job/career changes
> (3) Chronically unemployed
> (4) Student
> (5) Adolescent
> (99)No data available" (Sapp, et al., 1999, Sec. I, p. 13)

Likewise, the following codes were available for economic status:

> "_____ Economic status (most current outside institution)
> (1) Advantaged
> (2) Comfortable/average
> (3) Marginal but self-sufficient
> (4) Public assistance
> (5) Variable
> (6) Homeless
> (7) Other (list) _____
> (99) No data available" (Sapp, et al., 1999, Sec. I, p. 13)

For the job stability category, a coding of "(1) Generally stable – usually employed" will be considered organized. All others will be categorized as disorganized since none of these categories is capable of producing significant income. It could be argued that being a student does not necessarily indicate disorganization, but quite the opposite if the individual is an achiever. However, the data being used in this study have no cases where the participant was a student at the time of his arrest for a bombing offense. There were no instances of a coded response of "adolescent" in the data. For all cases, an economic status less than "comfortable/average" will be coded as disorganized while those better than and including "comfortable/average" will be coded organized.

Organized offenders are more deliberate, taking time to plan their crimes (Ressler & Burgess, 1985; Ressler, et al., 1986; Ressler, et al., 1988; Kocsis, et al., 1998). The variable *Time to Ponder* recorded interval responses from bombing offenders who were asked how long they considered their actions before actually engaging in a bombing. By definition, an impulsive act is one that occurs within a very short time interval of its contemplation. A bomber who immediately begins to act upon the desire to make a bomb would still need a marginal amount of time to obtain and assemble the bomb components before it could be used. Therefore, offenders who spend less than one day preparing for a bombing will be classified as disorganized while those contemplating the act for a longer period will be categorized as organized.

The independent variable, Offender Organization, will be compared to a series of dependent variables, consisting of specific offense behaviors, to determine if a correlation exists between the independent and dependent variables.

Dependent variables: crime characteristics. In a bombing case, the crime scene consists primarily of the location where the bomb detonates. Investigation of the bomb scene provides forensic evidence that will aid in the determination of the design and components of the explosive device as well as the target or intended victim selection (Vermette, 1998). The analysis of the incident will also help identify the explosive material used and any packaging material or containers intended to disguise or conceal the device. The packaging may also indicate how the device got to the blast scene, either placed by the bomber or delivered by a third party (i.e. mail, courier, or an accomplice) (TWGBSI, 2000). The design and construction of the device, victim or target selection,

and delivery of the device all reflect offender behavior. Using behaviors that are commonly observed at the scene of a bombing, this study will compare those behaviors to the independent variable – Offender Organization. The dependent variables selected from the NCAVC bomber study (Sapp, et al., 2001) are:

*Type of Explosive*
*Firing System*
*Fuzing Systems*
*Target*
*Arming Switch*
*Shrapnel Added*
*Disguise/Hide Device*
*How Device Delivered*
*Distance From Home*

The type of explosive used in a criminal bombing can provide valuable leads in the course of the investigation such as: the offender's relative skill in blasting techniques, the source of the explosive material, and the offender's ability to obtain explosives by legal or illegal means (Strobel, 1998). This variable is based upon the following question and responses from the NCAVC bomb study (Sapp, et al., 2001).

"What explosive(s) have you used before and why? Mark all that apply.

| What | Why | |
|---|---|---|
| ____ | ___ | (1) Black Powder |
| ____ | ___ | (2) Match Heads |
| ____ | ___ | (3) Improvised Mixture (list) _____ |
| ____ | ___ | (4) Gasoline |
| ____ | ___ | (5) Incendiary Hypergolic Mixture |
| ____ | ___ | (6) Dynamite |
| ____ | ___ | (7) Blasting Agent (list) _____ |
| ____ | ___ | (8) Detonating Cord |
| ____ | ___ | (9) Military |
| ____ | ___ | (10) Other (list) _____ |

Note to Rater: Mark Selections Below in "Why" Above

Why that explosive?

(1) Only one available
(2) Selected from several available
(3) Received from someone
(4) Stolen
(5) Self-manufactured, Preferred Material
(6) Self-manufactured, Limit of Ability
(7) Purchased
(8) Found
(9) Recommended by another
(10) Recipe called for it
(11) Other" (Sapp, et al., 1999, Part IV, Page 5)

Although the NCAVC bomb study question (Sapp, et al., 1999) collected data on both the explosive used and why a particular explosive material was used this study will only use data related to the first question: the explosive used. Explosive material will be classified as either low or high explosives.

Low explosives[4] are the explosive filler most commonly used in bombings within the United States (Bureau of Alcohol, Tobacco and Firearms, 2002) and they are easily improvised (Conkling, 1985). There are few controls and regulations concerning the purchase of low explosives. Black powder is not subject to regulation unless purchased or stored in quantities in excess of fifty pounds (Part 55, Commerce in Explosives) and smokeless powder, used in small arms ammunition, is exempt from federal regulation (Explosives Control Act, 1970).

[4] The terms "low" and "high" explosives are defined at 27 C.F.R. 55.202. High explosives detonate by means of a blasting cap when unconfined (dynamite). Low explosives deflagrate (burn) and explode when confined (black powder).

High explosives, such as dynamite, blasting agents and flash powders, are federally regulated with respect to licensing, storage, transportation, and sales (Explosives Control Act, 1970; Part 55, Commerce in Explosives). High explosives must be stored in approved steel magazines with double case hardened padlocks that are shrouded to protect the lock from attack. Persons who purchase high explosives must be licensed to use explosives and must sign forms, similar to those used for the purchase of firearms, when making an explosive purchase from a federally licensed explosives dealer. Bombers may improvise their own high explosives, but not without a certain amount of expertise in chemistry and detailed instructions. This activity is relatively hazardous, however (Department of the Army, 1986; Lecker, 1987; Benson, 1993; Benson, 1995). High explosives used in criminal bombings are usually obtained by theft or clandestine purchase (Bureau of Alcohol, Tobacco and Firearms, 1997).

The military uses both high and low explosives which are subject to the highest government controls (Departments of the Army and the Air Force, 1967) and are the least used explosives in criminal acts (Bureau of Alcohol, Tobacco and Firearms, 2002). Like commercial high explosives, all military explosives are not easily obtained, finding their way into the hands of criminals by theft or diversion (Bureau of Alcohol, Tobacco and Firearms, 1997).

The method used to initiate the bomb is another critical forensic finding at the bomb scene (Strobel, 1998). Explosives are initiated either electrically or non-electrically (ISEE, 1998). Evidence of the firing system will remain at the scene in the form of a blasting cap, power supply, or wiring used to conduct the electrical current in

the case of electrically fired devices, or a burning or chemical time delay (fuse) in the case of a non-electric system (Strobel, 1998). This variable was described with the following question.

"What initiator(s) have you used? Mark all that apply.

___ (1) Commercial Detonator – Electric*
___ (2) Commercial Detonator – Non-Electric+
___ (3) Military Detonator – Electric*
___ (4) Military Detonator – Non-Electric+
___ (5) Improvised Detonator (list)*+
___ (6) Hot Wire – Model Rocket*
___ (7) Hot Wire – Improvised*
___ (8) Safety Fuse – Commercial+
___ (9) Safety Fuse – Military+
___ (10) Pyrotechnic Fuse+
___ (11) Improvised Fuse+
___ (12) Other (list) _____" (Sapp et. al, 1999, Part IV, Pg. 6)

* Denotes electric firing system
+ Denotes non-electric firing system

Although it is possible for multiple responses to this variable and it is possible to have a "mixed" response, only three subjects in the NCAVC study (Sapp, et al., 2001) used combinations of electrical and non-electric systems. The responses are coded as nominal values for this variable: electric or non-electric.

Fuzing[5] mechanisms can be as varied as the imagination of the bomber. The fuzing mechanism is the action required to initiate the device, either electrically or non-electrically (Department of the Navy, 1997). Examples include mechanisms designed to complete an electrical circuit, cause two reactive chemicals to come into contact with one another, or release a spring loaded striker to impact a primer or detonator. The fuzing

[5] The term "fuze," as it is used in military and improvised ordnance, is spelled with a "z" while commercial explosives are usually spelled with an "s."

mechanism may be activated by a time delay mechanism, by the bomber as in radio control (called "command detonated"), or victim activated such as that found in most booby trap devices. Evidence of the fuzing mechanism may include clothespins with metal contacts attached, aluminum foil with wiring, and commercially purchased or improvised switches. The NCAVC survey instrument collected data in this area using the following question.

> "What fuzing systems have you used to function your devices. Mark all that apply.
>
> VICTIM ACTIVATED
> ___ (1) Lift
> ___ (2) Open
> ___ (3) Anti-disturbance
> ___ (4) Motion
> ___ (5) Noise
> ___ (6) Light
> ___ (7) Pull
> ___ (8) Pressure
> ___ (9) Pressure Release
> ___ (10) Other (list) _____
>
> TIME DELAY
> ___ (1) Electrical (describe) _____
> ___ (2) Chemical
> ___ (3) Mechanical (describe) _____
> ___ (4) Burning
> ___ (5) Other (list) _____
>
> COMMAND
> ___ (1) Wire
> ___ (2) Radio
> ___ (3) Other (describe) _____" (Sapp, et al., 1999, Par IV, Pg 7)

The responses were coded in the NCAVC study as three separate variables, Victim Activated, Time Delay, and Command, with values corresponding to the responses for

the question subheadings. The "Time Delay – Burning" system (burning pyrotechnic fuse) is the simplest and most common method of initiating low explosive powders and some high explosives where a non-electric blasting cap is used (ISEE, 1998). All other fuzing systems require more components and assembling the components requires more steps thereby increasing complexity. The three variables described above will be combined into one nominal variable, "Fuzing Systems," with two discrete values for the variable. The first value will be "Burning Fuse" and the second will be "Other." The "Other" category consists of all fuzing systems other than the time delay burning fuse.

The target of a bombing represents a selection process by the offender. Investigators (and profilers) attempt to answer the question, "Why was this person (or place) the target of this crime?" Douglas, et al, (1992) said that, within the context of criminal investigation, victimology is a complete history of the victim. An assessment of the victimology facilitates crime classification and may provide insight into the motivation for the crime as well as offering possible explanations for the behaviors of the criminal suspect. Very often, just answering the question of who the bomber intended to victimize will lead the investigator to the motive which may ultimately lead to the offender.

This nominal variable is measured using a question that asked the participant to describe the locations where bomb(s) were placed. The available responses in the instrument were: residences, businesses, other structures, vehicles, wildland/vegetation, and other. The categories for residence and vehicles will be combined into one value

where the offender likely targeted an individual and a separate value for all other targets (business, other structures, wildland/vegetation, other).

An arming switch is a safety device added to an electrically fired bomb. It interrupts the circuit between the power source and the detonator (blasting cap) in order to prevent an accidental detonation while the bomber is transporting or placing the bomb (Department of the Navy, 1997). The presence or absence of an arming switch may be an indicator of carelessness, the impulsiveness of the act, or the amount of risk the bomber is willing to be exposed to in the commission of the crime. The survey instrument asked a yes/no question as to whether or not an arming switch was used and it was subsequently coded as a nominal variable.

Shrapnel is projectile material added to a bomb that is propelled outward from the blast by the explosive force. The one and only purpose of shrapnel is to enhance the potential of the bomb as a weapon – specifically an anti-personnel device. Shrapnel serves no other purpose than to kill or maim human beings (Marshall, 1977). The addition of shrapnel is an indicator of the intended lethality of the device that would distinguish it from experimentation with explosives (Kelm, 2001). Whether or not shrapnel was added to a bomb appeared in the NCAVC instrument as a yes/no question coded as a nominal variable.

The bomber who takes the time and makes the effort to disguise or hide a bomb clearly intends it to remain undiscovered until it detonates. Presumably, the bomber does this to make the bomb appear innocuous. Placing the bomb inside of some type of packaging may also facilitate delivery of the device by a third party, such as the postal

service, without exposing the bomber to additional risk of discovery. Evidence of concealment may be a manifestation of additional deliberation by the offender and, therefore, an indicator of greater organization. The instrument question related to this variable was:

"Did you disguise or hide your device in any way?" (Sapp, et al., 1999)

The available responses were yes and no, coded as a nominal variable.

In the same vein, how the device was delivered may indicate the degree of planning that went into the bombing crime. The bomber who hand delivers the device to the target may expose himself to greater risk than one that causes the device to be delivered by someone else or placed anonymously. The question used in the instrument was:

"How did you <u>usually</u> deliver the bomb(s)?

(1) By hand, in person
(2) Use of a confederate
    (a) Knowing
    (b) Unknowing
(3) U.S. Mail
(4) Parcel service (UPS, FEDEX, other)
(5) Other (list) _____" (Sapp, et al., 1999)

This nominal variable will be coded with two values – "By Hand, In Person" and "All Other." These two values distinguish the bomber that accepts personal risk by delivering the bomb in person as opposed to any other method of delivery that removes the bomber from direct involvement in placing the bomb on target.

In a series of bombings a pattern of behavior often emerges, including the relative distances between bombing incidents. Additional information may be developed during

the course of the bombing investigation related to significant crime locations such as where the explosives or bomb components were obtained. Another essential piece of geographical evidence may be the location from where the bomb was mailed or delivered. An analysis of these crime locations using geographic profiling techniques may identify the offender's residence or "anchor point" (Rossmo, 2000). Distance between crime sites has been cited as an indicator of offender organization (Ressler & Burgess, 1985; Ressler, et al. 1986; Kocsis et al., 1998). The survey instrument asked the participant to indicate the distance from his residence that the bomb was placed ranging incrementally from "Set at Home," one block to one mile from the home, and from one mile to 100 or more miles away. An additional response was available for offenders who placed a device inside of an institution where they were being housed (prison, hospital, etc.). This variable will be coded with two values where all responses of less than two miles, including "Set at Home" and "Institution," will be combined into one value. The second value for this nominal variable will include all distances of two miles or more.

Measures

The bomber data derived from the NCAVC study (Sapp, et al., 2001) used in this study will be classified as either organized or disorganized using the eight variables already described. In each case, a nominal solution will be forced for the data. The aggregate of the eight variables, where at least five of the eight are coded as either organized or disorganized, will then determine the overall coding for each case creating the independent variable, "Offender Organization."

The SPSS software will be used to analyze descriptive statistics as well as measures of association and tests of statistical significance between the study variables. Each dependent variable (crime scene characteristics) will be compared with the independent variable (offender organization) using the Chi-square ($\chi^2$) goodness of fit test as a non-parametric test of significance. This test is useful when comparing nominal variables (Maxfield & Babbie, 1998).

The phi-coefficient ($\Phi$) will be used as a measure of association that is employed in 2 x 2 contingency tables involving two variables that are dichotomous. This test is a type of the Pearson product-moment correlation coefficient that is computed where the values 0 and 1 are employed to represent the levels of two dichotomous variables as is the case in this study. The hypothesis evaluated in the phi-coefficient tests is whether or not the observed cell frequencies are different from the expected frequencies (Sheskin, 2000). A value of 1.0 indicates the strongest association where as values approach zero, the strength of association decreases as well (George & Mallery, 2001).

Research Question

This comparative study will attempt to determine if there is a correlation between bombing crime scene evidence characteristics and bomber organizational traits. The null hypothesis is that there is no relationship between bombing crime scene evidence characteristics and the relative organization of the bomber.

# Chapter IV

## Data Analysis

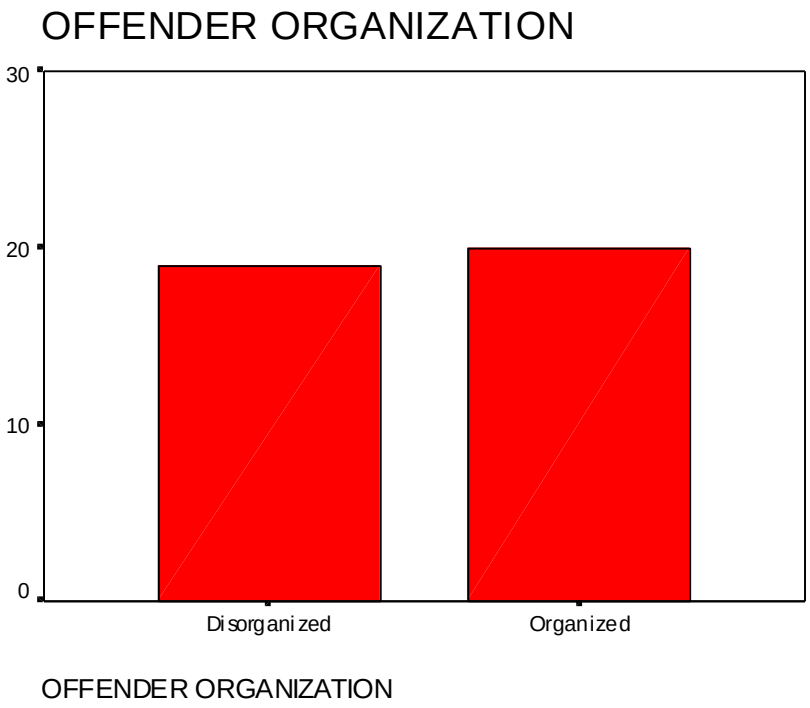
Fifty-seven cases in the original NCAVC bomb study (Sapp, et al., 2001) data set were evaluated for inclusion in this study. Of the 57 cases, 39 contained complete data in all of the variables tested. The data (n = 39) was loaded into and a database created in the SPSS computer program. Summary statistics were run to determine frequencies among the various variables. The bivariate measure of association used was cross-tabulation analyses including the phi-coefficient (Φ) for 2 x 2 contingency tables involving nominal variables – *Type Explosive, Firing System, Fuzing System, Shrapnel Added, Arming Switch, Target Selection, Device Delivery, and Disguise/Hide Device, Distance From Home*. Statistical significance of the relationship of each dependent variable to the independent variable was tested using Chi Square ($\chi^2$).

The Independent Variable – Offender Organization

As previously defined, the independent variable, "Offender Organization," consists of two values, organized and disorganized. Eight sub-variables were used to categorize each offender as organized or disorganized. The sub-variables used were: o*ffender age (at time of offense), marital history, living with someone at time of offense, loner, highest school grade completed, job stability, economic status,* and *time to ponder.* Each sub-variable was reduced to nominal data reflecting either the organized or the disorganized value. An aggregate of the eight variables with five or more of the eight sub-variables categorized as either organized or disorganized, was used to label each case

as tending towards being either organized or disorganized. Twenty cases were "Organized" and 19 were "Disorganized" (Figure 4.1).

Figure 4.1. Frequency of disorganized and organized offenders within the variable, "Offender Organization."

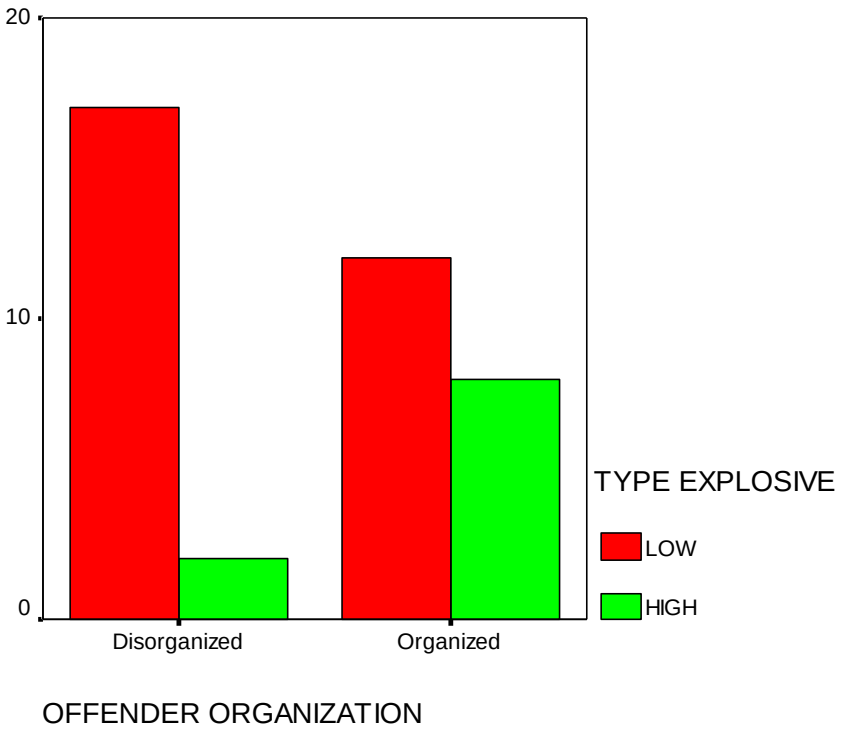



Analysis of the Dependent Variables

Type explosive. The various types of explosives used by the offenders were grouped into two categories: low explosives and high explosives. Seventeen disorganized offenders used low explosives and 2 used high explosives. Of the organized offenders, 12 used low explosives and 8 used high explosives (Figure 4.2). The measure of association used for this variable was the phi-coefficient (Φ) which was calculated as

$\Phi = 0.337$ indicating a low strength of association. Chi-square was calculated as $\chi^2 = 4.439$, F = 1, p = 0.035, statistically significant at the .03 level. One cell had an expected frequency less than 5 (disorganized using high explosives), however. There is some debate as to acceptable cell frequencies. Generally, where cell frequencies are low, the trustworthiness of Chi-square is lessened (Sheskin, 2000).

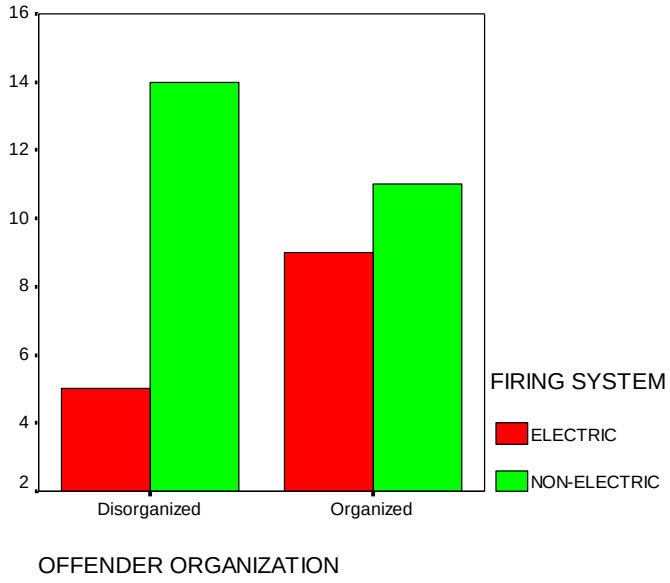
Figure 4.2. Frequency of explosive type used by offender organization.




Firing system. The firing system, or the method used to initiate the explosive charge, was classified as either electric or non-electric. Of the 19 disorganized offenders, 5 used an electrical method of initiation while 14 used a non-electrical method. Nine organized offenders used an electric system while 11 used non-electric (Figure 4.3). The value of phi ($\Phi$) was -0.195 indicating no association between the variables. The

probability of the relationship being associated as a result of sampling error exceeded 20% ($\chi^2$ = 1.478, F = 1, p = .224).

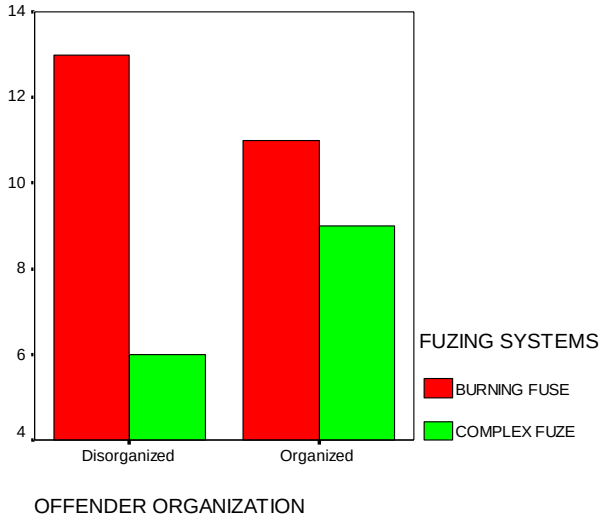
Figure 4.3. Frequency of firing system used by offender organization.




Fuzing Systems. The variable "Fuzing Systems" consisted of two values – Burning Fuse and Complex Fuze (Figure 4.4). Thirteen disorganized offenders and 11 organized offenders used a burning fuse. A complex fuzing system was used by six disorganized and nine organized offenders. The value of Φ was 0.138 indicating a minimum strength of association. The Chi-square value was calculated as $\chi^2$ = 0.742, F = 1, p = 0.389) indicating the probability of the relationship being associated as a result of sampling error approaches 39%

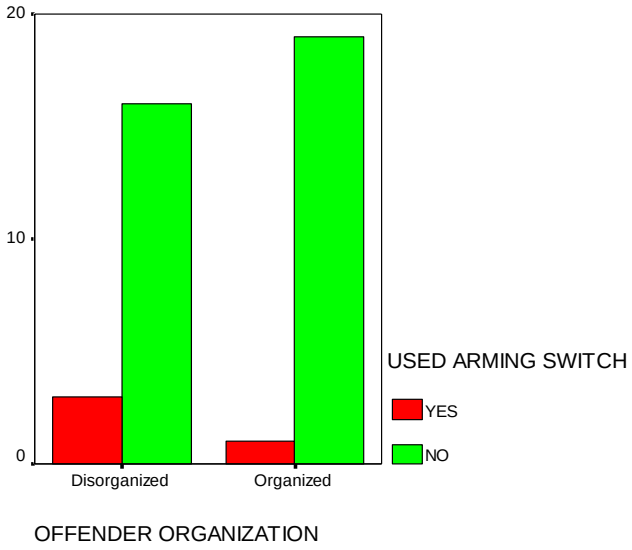
Arming switch. Three disorganized offenders and only one organized offender used an arming switch while 16 disorganized and 19 organized did not (Figure 4.5). The

Figure 4.4. Frequency of fuzing system used by offender organization.




value of phi (Φ) was 0.178 and the measure of significance was $\chi^2 = 1.232$, F = 1, p = 0.267 indicating low association strength with a chance of sampling error in excess of 25%. Two cells had frequencies less than the expected 5 causing the trustworthiness of the Chi-square value to be suspect.

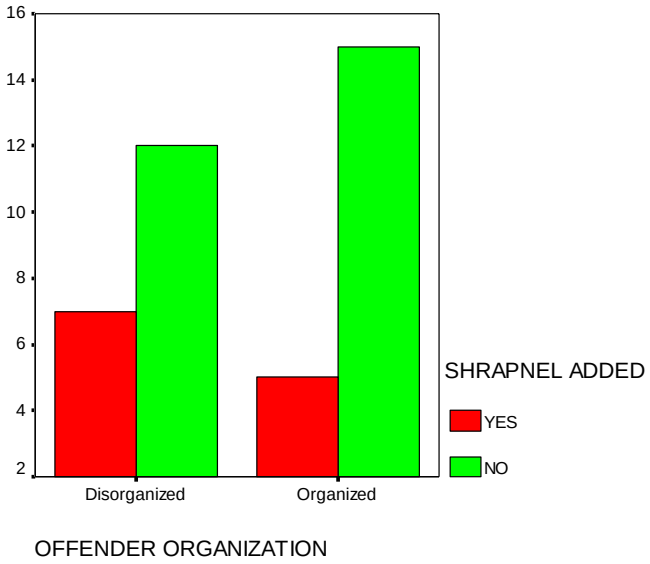
Figure 4.5. Frequency of arming switch used by offender organization.



Shrapnel added. Seven disorganized and five organized offenders added shrapnel to their bombs while 12 disorganized and 15 organized offenders (Figure 4.6) did not add shrapnel resulting in low association strength ($\Phi = 0.128$). The potential for sampling error exceeds 40% ($\chi^2 = .641$, F = 1, p = 0.423).

Target selection. Five organized and 11 disorganized subjects selected personal targets. Eight disorganized offenders selected other targets as did 15 of the organized subjects (Figure 4.7). The value of the phi-coefficient ($\Phi$) for this variable was 0.334 while $\chi^2 = 4.358$, F = 1, p = 0.037. This variable has a minimal association with offender organization. The relationship is statistically significant at the .04 level.

Figure 4.6. Frequency of shrapnel added by offender organization.




Device delivery. This variable consisted of the values labeled: *By Hand/In Person* and *Other* (indicating other methods such as mail delivery).

Figure 4.7. Frequency of target selected by offender organization.

Sixteen of the disorganized and 19 of the organized offenders delivered the bomb by hand in person. Only three disorganized and one organized offender used other methods of deliver (Figure 4.8). With two cells containing frequencies less than the expected five, the Chi-square value ($\chi^2$ = 1,232, F = 1, p = 0.267) is not trustworthy. The phi-coefficient ($\Phi$ = 0.178) indicates low association strength.

Disguise/hide device. Seven disorganized offenders and nine organized offenders took steps to hide or disguise the bomb from the victim while 12 and 11, respectively, did not (Figure 4.9). This variable showed almost no association strength ($\Phi$ = - 0.083) with statistical significance of approximately 40% ($\chi^2$ = 0.268, F = 1, p = 0.605). Cell frequencies less than five make the Chi-square value untrustworthy.

Figure 4.8. Frequency of delivery method by offender organization.

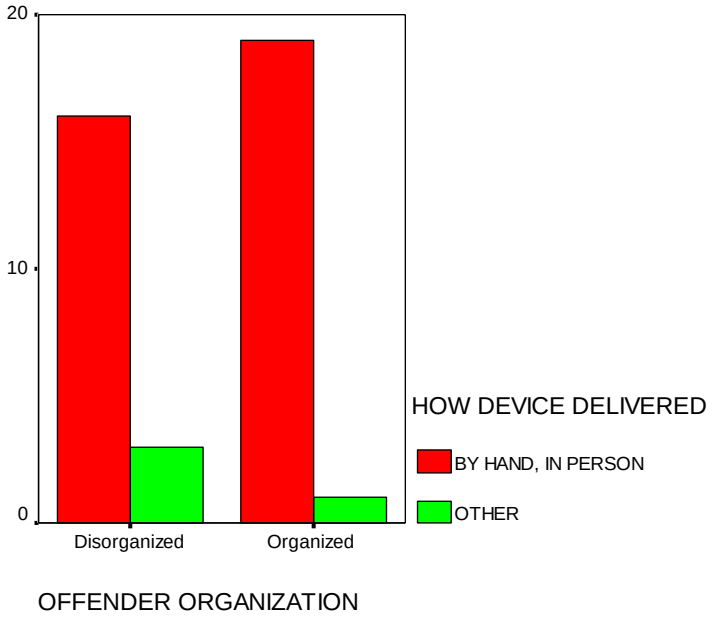
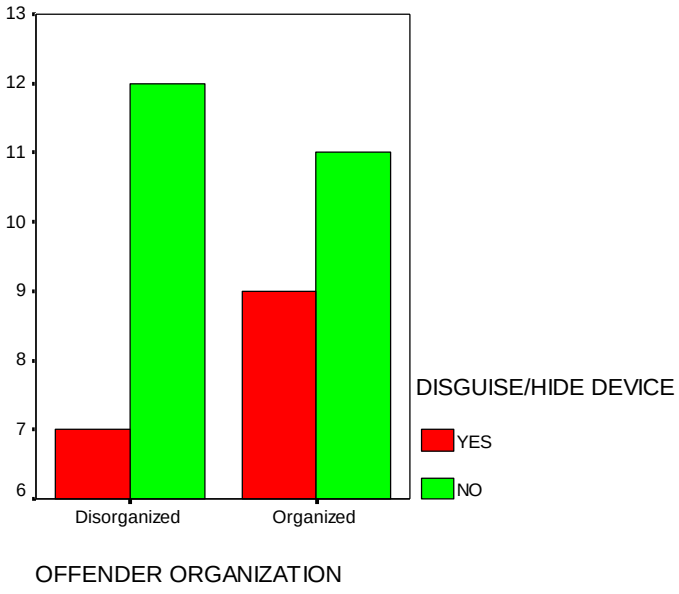
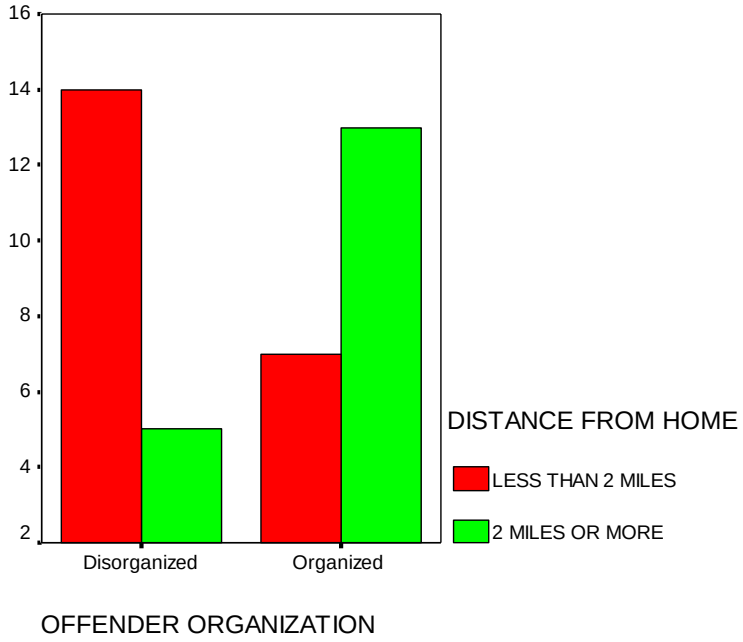



Figure 4.9. Frequency of disguise/hide device by offender organization.



Distance from home. This variable measured the distance of the bombing scene from the subject's residence. Fourteen disorganized and seven organized offenders used a bomb less than two miles from their residence while five disorganized and 13 organized

Figure 4.10. Frequency of distance from home by offender organization.




offenders used the bomb two or more miles from their residence (Figure 4.10). Low association strength was noted for this variable ($\Phi = 0.388$) while the statistical significance was at the 0.01 level ($\chi^2 = 5.867$, $F = 1$, $p = 0.015$).

# Chapter V

## Conclusions

It was the purpose of this study to determine if selected crime scene characteristics of criminal bombing cases could be used to predict the level of organization of the bombing offender. The data did not support this hypothesis, however and the null hypothesis could not be rejected.

The numbers of disorganized and organized offenders were almost equally matched (19 and 20 respectively). Bivariate correlations of the data showed weak associations between the independent and dependent variables. The correlation coefficients ranged from 0.388 to -0.195 for *Distance from Home* and *Firing System* respectively. Although some of the measures were statistically significant, threats to validity included low (n) in the cells of several crosstablualtions as well as probabilities up to the 0.60 level or 40% probability of the null hypothesis (no association).

It would seem there is little utility in associating crime scene characteristics with the concept of offender organization in bombing cases. This conclusion must be tempered by the following considerations, however.

- The sub-variables selected to comprise the Offender Organization variable may not be sufficiently related to the concept or more sub-variables might be required to build the variable.
- The population (N=39) may be too small. It is quite likely that statistical insignificance is related to non-probability sampling.

- The independent variables selected are not representative of the full range of observable bomber behavior.
- Data may have been skewed in the truncated sample (n = 39) by excluding cases from the total population (N = 57) that did not contain data in all of the variables selected. Cases excluded may have tended towards one of the independent variable sub-groups (organized or disorganized).

Furthermore, no multivariate inferential tests were conducted due to the limitations of the data and the nominal construction of the independent variable.

What is apparent in this study is the lack of variation in the offense (dependent variable) characteristics between organized and disorganized offenders in most cases. The subjects in this study used low explosives almost 75% of the time with some difference between organized (60%) and disorganized (89%) offenders. This consistency between the two classifications of bombers probably accounts for the low level of association between them and the type of explosive used.

The same consistency was observed in the firing and fuzing systems used. Fifty-five percent of the organized offenders used a non-electric firing system compared to 74% of the disorganized offenders. Although organized bombers were more likely to use a complex fuzing system, such as a victim activated device, the association was not sufficiently correlated ($\Phi = 0.138$).

Very few offenders in either category (4 total) used an arming switch and less than 37% added shrapnel to the bomb. With little variation between the organized and

disorganized groups, and the low frequency of offenders using an arming switch threatening validity, these two variables have little predictive value.

The target selected was significantly different between organized and disorganized offenders. Oddly enough, organized offenders only bombed personal targets, such as residences and vehicles 25% of the time where the disorganized subject's target selections were fairly evenly matched (personal 58%, other 42%). Despite the difference in target selection, the strength of association was only 33% with a relatively high significance ($p = 0.037$).

The study subjects overwhelmingly delivered their bombs by hand (84% disorganized, 95% organized) as opposed to any other method. The same consistent pattern was observed between the two offender types where steps were taken to disguise or hide the bomb. Thirty-seven percent of the disorganized offenders and 45% of the organized offenders engaged in this behavior.

Disorganized subjects were more likely to bomb less than 2 miles from their residence (75%) whereas organized bombers demonstrated a greater propensity towards bombing two miles or more from their residence (65%). This variable had the highest strength of association ($\Phi = 0.388$) with offender organization and a fairly high level of significance ($p = .015$). However, the data does not sufficiently demonstrate a relationship between the independent and dependent variables.

Assuming the offender organizational model is valid, what is striking in the results of this study is the similarity in offense behaviors of organized and disorganized bombers. This may be due to many factors inherent in the crime. An example might

include the ready availability of low explosives as opposed to the relatively strict controls over high explosives and military explosives. Consequently, the prevalence of one type of explosive predisposes a particular type of fuzing system (burning fuse), and so on, where those offense behaviors that precede them influence each additional offense behavior.

The results of this study are consistent with national statistics of criminal bombings (Bureau of Alcohol, Tobacco and Firearms, 2002). The single most common destructive device (bomb) employed in the Unites States is a pipe bomb containing a low explosive, initiated with a burning fuse, with no arming switches or other safety devices and no shrapnel added, that is hand delivered to the target.

If one assumes that *successful* bombers, as a sub-group of all violent criminals, are by necessity more organized than other types, the differences between organized and disorganized bombers may be too subtle to differentiate their offense behavior. Perhaps it is the *unsuccessful* bombers, those that are excluded from the sample population because their failure placed them in a hospital or the morgue, who would exhibit significant differences in offense behavior that would distinguish them from those in the prison system.

This study has created more questions than it answered. Instead of validating the offender organizational model, it has called it further into question. The model might be better examined using some other offender population.

Recommendations

Given the current understanding of the relationship between bomber organizational characteristics and bomb crime scene evidence, criminal investigative analysis of bombing cases using the offender organizational model is likely to be problematic, at best. The model appears to have little utility due to the apparent commonality of bombing methodologies.

This study should be replicated using a larger study sample. The truncated sample available in this study might be supplemented using additional bombing data bases maintained by the Bureau of Alcohol, Tobacco, Firearms, and Explosives and the Federal Bureau of Investigation.

The study sample bombing characteristics should be compared with national bombing statistics in order to ensure reliability. Additional offender and offense characteristics should be included in the variables to determine whether or not bomber characteristics and bombing behavior is more stratified or, as in the case of this study, is not easily distinguished. Changes in the makeup of the independent variable from a dichotomous to an ordinal measure would allow for additional testing using non-parametric multivariate analyses that might demonstrate a level of synergy of all the dependent variables in concert with one another when compared to offender organization.

Finally, the methodology used in this study might be employed to replicate the original study by Ressler, Burgess, Douglas, Hartman, & D'Agostino (1986) and the subsequent study by Kocsis, Irwin & Hayes (1998).

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# Appendix 1

NCAVC Data Collection Instrument, Sections I & IV
(Sapp, Huff, Kelm, & Tunkel, 1999)